CALIFORNIA TRANSPORTATION FUTURES CONFERENCE:

Transportation Strategies to Serve California's People, Enhance Its Prosperity, and Protect Its Resources

Summary of a Two Day Conference
Held in Los Angeles
June 21-22, 2001

Presented by the UCLA Extension Public Policy Program
Sponsored by the California Department of Transportation

Report Prepared by:
Dan Chatman and Lisa Schweitzer
UCLA Institute of Transportation Studies

Edited by:
Joanne Freilich
UCLA Extension Public Policy Program

This report was prepared as part of a project sponsored by the California Department of Transportation, Transportation Planning Program, with funding from the Federal Highway Administration, under Interagency Agreement No. 74A0011. The views expressed herein are those of the conference speakers, participants and authors of this report and do not necessarily represent the views of the State of California or the Federal Highway Administration.

This conference summary is posted on the following website:
http://www.dot.ca.gov/hq/tpp/offices/osp/ctp.htm

TABLE OF CONTENTS

Introduction ……..……..i

Conference Summary ..……1

Appendix ……38

- Symposium Program
- Roster of Participants

Introduction

The dramatic growth and increasing diversity of California's residents, restructuring of the world's economy, increased growth pressures on the state's natural resources, and scarcity of funds to fully address mobility and accessibility needs, all constitute a profound challenge to those who rely on and plan for an efficient and effective transportation system.

A two-day statewide conference was held on June 21-22, 2001 to provide a common information base for assessing important trends that will impact transportation planning issues confronting this state over the next several decades. It engaged policy makers, planners, different interest groups, and community leaders in analyzing both strategies and processes to develop plans that fit transportation needs confronting the state as a whole, our different regions, and our diverse communities and residents. This report is a summary of the information presented and discussions that took place at the conference.

The conference, the second in a three-part series of programs, was designed to complement the current process of developing a 2025 statewide transportation plan for California, as well as the many regional transportation planning efforts that are underway.

The first program held as part of this series was an invitational symposium November 30 – December 1, 2000 that began identifying demographic, economic, technological, environmental, and financing factors that are shaping California's future, and that create the context for formulating future transportation policies and plans. A separate summary report was prepared for that symposium.

The third and final segment of this series will be an invitational retreat in November 2001 among key policy leaders who will review the goals, policies and strategies in the draft California Transportation Plan before it is released for widespread public review.

This series has been organized and presented by the Public Policy Program of UCLA Extension and is sponsored by the California Department of Transportation.

Conference Summary

Transportation Planning Strategies to Serve California's People, Enhance Its Prosperity, and Protect Its Resources

Thursday, June 21

Conference Welcome

LeRoy Graymer, Founding Director, UCLA Extension Public Policy Program

As part of California's statewide planning effort, this conference focuses on the myriad challenges and opportunities that California will face in the coming two decades. The first day of the conference looks at California's global transportation and economic trends, and how the nature of growth and economic change in California is influencing the kind of planning we need to do.

California's population is changing dramatically. We expect another 10 to 15 million people over the next twenty years. The ethnic composition and age structure associated with population growth are central issues for transportation planning. Transportation is about access by people to people, and demographics will play a large role in determining the need for access. Part of understanding changing demographics is understanding equity. The last session today will be a dialogue about how we can make transportation provision more equitable.

Tomorrow the conference turns specifically to strategies, as we explore how to develop policies and plans that take into account the major changes occurring throughout the state.

Joanne Freilich, Program Director, UCLA Extension Public Policy Program

Sponsored by Caltrans, this conference complements the current process underway by the department to develop a statewide transportation plan for California. As a university, UCLA has organized this conference around presentations that provide information and analysis that bear on California's statewide planning efforts. But the conference is not only informational; on day two, we will discuss strategies and processes.

Session I. Dynamic Forces Shaping The World of the 21st Century: Thinking Creatively to Meet Transportation Challenges

Keynote Address by John Kasarda, Director, Kenan Institute of Private Enterprise, Kenan Distinguished Professor of Management, and Professor of Information Technology and E-Commerce, Kenan-Flagler Business School, University of North Carolina at Chapel Hill

Transportation facilities transform cities. Seaports fueled the first wave of urbanization, river and canal-based development drove the second wave, and railroads were the transportation technology that caused the third wave of urbanization. When the second and third wave occurred, however, seaports did not necessarily become less important. Rather, innovations in transportation caused a new burst of development. Highways led the fourth wave of urban

development, causing tremendous deconcentration. And now we have the fifth wave—airports, which will continue to shape development into the 21st century.

The current boom in air freight coincided with remarkable advances in telecommunications, and in particular, the development of global supply chains. Telecommunications enabled the global integration of production activities in real time. The result is that markets are integrating, with tons of goods moving across international borders daily and covering long distances in shorter time periods. Firms no longer compete, but their supply chains, networks, and systems do. For example, the components of a Hewlett Packard laptop have 314 border crossings. The cost, quality, and bottom-line profits of a firm are as much a function of upstream and downstream suppliers as what goes on within an individual firm. A firm's competitive power is in its supply chain and network, which are increasingly global.

Prior to telecommunications, price competition drove firm location and strategy. Firms began to simplify and dilute the quality of their products. The conventional wisdom was that Americans would accept the minimum quality product as long as it had the minimum price. But by the 1980s, quality had become important to consumers again. Total quality management demanded zero defects, and by the 1990s firms had to have both a quality product and competitive pricing, or they were out of the game. So firms began to compete on speed in the 1990s. Transportation became value-added, and delivery won sales.

Along with time-based competition, firms now mass-customize rather than mass-manufacture. Globally, customers want American products modified to suit their own tastes. They want these customized products in a time-definite fashion—on time, just in time, every time.

Because time-based competition has grown so fierce, we should not confuse the death of "dot-coms" with the death of e-commerce. Businesses-to-business e-commerce transactions alone are forecasted to increase from $500 million in 2000 to $3.6 trillion in 2005. E-commerce and air logistics have become inextricably linked. More than 70 percent of Internet orders are shipped through air express. For air freight competitiveness, however, surface transportation is key. In the time-based competition of the Internet, firms win the battle for sales on the ground, not in the air. As a result, we see e-commerce fulfillment centers clustering around airports.

Air logistics is already a $200 billion industry. In 2000, 42 percent of the value of world trade traveled by air, but this represented less than 2 percent of the cargo weight. Sixty-five percent of US air cargo is sent express, and we have seen a 20 percent average annual growth in air freight over the past two decades. World air cargo traffic is expected to triple over the next 18 years, because international air express service is tied to increasingly prevalent global production chains.

Airports have begun to drive the development of high-technology centers. High-tech centers serve as agglomerative forces for business services and regional headquarters offices. Increasingly, auditing, accounting, and consulting firms gravitate near airports where their professionals fly regularly or where they bring their customers in by air. The propensity of high-tech workers to travel by air has important consequences for both air and surface transportation surrounding airports.

New planned aerotropolises are springing up, with large facilities of a million or more square feet being built. The emerging aerotropolis has three features: (1) distinct clusters and spines of development linked to businesses radiating outward from the airport, (2) "aerolanes" (dedicated expressways), "aerotrains" (dedicated fast rail), and intermodal services; and (3) low-density development, with wide lanes and fast surface transportation. Four years ago, there was almost

nothing on Lantau Island until Hong Kong built an international airport there. Disney located a Disneyland there because of the increased accessibility and dedicated transportation links.

Airports are potent economic development tools. Los Angeles International Airport is responsible for 400,000 direct, indirect, and induced jobs in the five-county Southern California region, and over $60 billion annually in regional economic activity. The Inland Empire is becoming one of the nation's premier multi-modal logistics centers. From 1995 to 2000, over six hundred new manufacturing firms located in the area. United Parcel Service handles over 700 million pounds of freight annually there, and Federal Express over 100 million. This intensity of air traffic has consequences for surface transportation. Orange County has the most intensive truck interchange in the US. Similar factors support the development of aerotropolises throughout the US and the world.

Airports will drive 21st century urban development as much as highways, railroads, and seaports did in their respective periods. Aviation, digitization, globalization, time-based competition, and air logistics are creating new, aviation-linked urban forms. Intermodal surface connectors are key to making this happen, and those will be the strategic investment choices for regions and states.

Session II. California's Future: Growth, Population, and Economic Change

A. Economic Change in California: Impacts on Transportation

♦ *Moving People Intra- and Inter-Regionally*

Genevieve Giuliano, Professor of Urban Planning & Development, School of Public Policy, Planning, & Development, University of Southern California

Vastly improved information flow and declining travel costs have allowed fundamental changes in economic structure. Improved information technology has changed production and service distribution as well as the demand for goods and services. This, in turn, has changed consumption and work patterns, and those have transformed urban form and transportation demand.

Of the top 25 US high-tech centers identified by the Department of Housing and Urban Development, six are located in California. Every major county in the state is listed as a high-tech center, from Los Angeles to Oakland. In all of these locations (as well in Sacramento) both the number of high-tech jobs, and the number of new high-tech jobs grew from 1982 to 1997. San Jose has the highest concentration of high-tech employment.

In California, smaller tech centers, like San Jose, are growing faster than the large centers in both population and employment. The distribution of high-tech growth relative to other jobs shows that Los Angeles has the look of an old eastern city, in that the employment growth is much slower in the central city than in outlying areas. The opposite is true for Orange County and San Jose.

Travel behavior differs in high-tech clusters from that found in other areas. The rate of growth in personal vehicle miles traveled (VMT) and commercial air passenger trips is much higher in small high-tech clusters than other places, though the absolute volume is still higher in the larger high-tech centers.

Concurrent with the development of high-tech and information-based work, flexible production has led to flexible work schedules. In the "new economy," there is much more contract, short-

term, and temporary work, self-employment, mobile work, and flexible work arrangements. Flexible work arrangements affect a wide range of workers, including knowledge and specialized workers.

Similarly, the contingent workforce is growing. Although numerous definitions for contingent work exist, it generally includes those workers with no explicit or implicit contract for ongoing employment. California and the US will experience an increase in the number of contingent workers, but they will remain a very small portion of the workforce. Even so, the growth in contingent work will affect job and household turnover and subsequently, travel demand.

In 1991, about 15 percent of workers had flexible work arrangements. By 1997, the number was about 28 percent. Most flexible work arrangements go to high-end laborers, and the work is still clustered around an eight- to nine-hour day. Distributed work—work done in more than one place, such as home-based work—has seen a moderate increase from 1991 to 1997. Again, wage and salary workers have been those compensated for home-based work.

Some home-based work involves telecommuting, but telecommuting also describes any work arrangement in which the employee relies on telecommunications and works at an alternate site, such as a tele-center. About 8 percent of workers telecommute, and about 0.5 to 1.5 percent of workers telecommute on any given day. On telecommuting days, there are fewer total trips by the worker's household. The ultimate effect of telecommuting on total VMT, however, is still unclear, because little is known about telecommuting's effect on mode choice, trip chaining, trip timing, or latent demand effects. The best estimate is that a 6 to 10 percent share of telecommuting on a given day would result in a 0.5 to 1 percent decrease in VMT on that day. Home-based workers, however, typically travel more than anybody else in the household, because they make a lot of business-related trips.

For other types of flexible work arrangements—such as temporary jobs or mobile work—we have very little information. Currently we do not know how temporary jobs affect commute distance, or how such jobs will affect residential location decisions. There is much conjecture about mobile work—i.e., work with cell phones, laptops, and mobile offices—and how such work will affect travel. The one paper that has been published on the subject suggests that people with mobile offices travel more, which is why they have the mobile equipment.

Information technology also affects nonwork activities and travel. E-commerce, tele-medicine, and tele-courses have all become relatively commonplace. However, we are still at the beginning stages of adoption, and we have little data on how information technology affects nonwork travel.

Globalization has spurred a tremendous increase in intercity passenger travel, which has been greater than the increase in intra-city travel. Business intercity trips are the longest (just over 1,000 miles on average) trips involving one person, and these trips also have the shortest duration. An increase in business intercity trips portends an overall increase in air passenger travel. Furthermore, as businesses globalize, destinations outside the country increase.

Infrastructure supply constraints loom as one of the major issues facing California in the era of globalization. California currently has congested freeways, congested airports, and congested ports. To make matters more difficult, we also have a disconnect in the global economy between who benefits from and who pays for transportation facility expansions, and there is a persistent and growing public opposition to infrastructure projects. In order to address supply constraints, the state needs to consider who is willing to pay for new infrastructure, and how much they are willing to pay. For example, will people continue to rely on deliveries if they must pay the full transportation costs? Finally, addressing infrastructure supply constraints may require paying

compensation to local residents who bear the external costs of facility expansion that promises dispersed regional benefits.

- ***Getting Goods to Market Within California and Beyond : The Future of Freight and Goods Movement in California***

Randolph Hall, Director of the METRANS Transportation Center and Professor and Chairman, Industrial & Systems Engineering, University of Southern California

In Southern California, the economy and the demands it places on transportation are influenced heavily by international trade, which itself has been enabled by shared information technologies, un-tethered communication (the ability to create a presence where you are not is key to doing business in separate time zones), the conversion of physical media to electronic media, virtual reality, and automation.

Being somewhere where you are not is a new thing. For example, voice mail has been around for some time. But some aspects of information technology are quite new: the Internet allows for shared and decentralized information in both production and consumption. Furthermore, it has allowed for the conversion of physical media to electronic media. For example, downloadable files have replaced compact disks. Virtual reality itself means being in another place without actually being there, which can substitute for transportation. Are these technologies revolutionary to the degree that other innovations in human interaction have been?

In the past, transportation technology has made economic interaction possible. In 4000 BC, the technology was the wheel. Then writing developed in 3000 BC, so that information could be transmitted over distance and time. With paper in 100 BC, information became portable. And then came powered transport with the steam engine in 1800, and then innovations in immediacy, such as the telegraph in the 1840s. Now we have voice, video, and digitalization—all means of creating presence, of being in a place where you are not.

Archaic supply chains relied on local resources, individual designs, and local customers. Modern-era supply chains are globally sourced, have dispersed design and manufacture, and serve a global customer base. Perhaps one hundred years from now the role of physical products will be very different, to the extent that physical goods can be substituted virtually, or produced locally (enabled through automation) to avoid transportation.

Home life, too, has been transformed by economic and transportation changes. Archaic home life centered on clans and natural resources. Modern home life has been city-based and linked to workplaces. Technologies that allow us to create presence, however, have begun to make the workplace into an archaic concept. Community, home, and work are beginning to coincide. Previously, we had a segregated work life, and people relocated to serve their work. In this way, the home becomes interconnected with work, and personal preferences, rather than job access, will drive home location choices in the future.

New communities also have evolved. Unlike clan-based archaic communities, communities of the past century have tended to be defined by economic dependencies and enhanced by electronic communication like telephones. But even now, electronic communities of interest have developed, and face-to-face interactions are reserved only for close relations and friends.

Information technologies will have manifold effects on transportation in terms of trip frequency, distance, shipment sizes, travel modes, technology, and the substitution of goods travel for personal travel.

The Web Van service is a primary example of a new e-commerce business which offers the opportunity to substitute delivery services for personal travel. The service allows customers to order groceries from a website for home delivery, but the company has not prospered and may close. It is difficult for a company like Web Van to replicate for the customer the value-added of being able to personally inspect products. Trips to a supermarket currently are not very costly to customers, so home delivery services for groceries may not be as useful to customers as deliveries for other, more specialized products.

Currently, online industry segments include integrated providers (such as Web Van), fulfillment (Amazon.com, various cataloguers), sales/matchmaking services (automobile estimates, price-quoting for insurance and travel), and transportation services and logistics (Federal Express, United Parcel Service). The transportation services industry is especially important to understand when planning infrastructure. This industry requires a multilayered network consisting of drop, on call, scheduled, and drop box pickups; local terminals for sorting and consolidating; transportation to a hub; and surface delivery to destination. Furthermore, the industry faces some daunting challenges. For a West Coast pickup to be delivered to the East Coast, firms must deliver in a time window of about 14.5 hours, and they have up to five handling steps for sorting and processing during such a delivery.

California's role in the new economy will be as an international gateway for many transportation service industries, especially through airports. Also, the state has a big stake in food production and distribution that will continue to be important, as well as its growing role as a home for technology development. California's population is itself a mass market of consumers. The immediate challenges in the state are to provide and maintain corridors for freight transport to the rest of the United States, develop adequate infrastructure to serve the inland areas, and ameliorate urban congestion. These are the short-term challenges.

In the long term, international trade may not be as important to California as it is now. Internationally, different parts of the world will specialize in either goods manufacturing or product design. For California, such specialization may cause goods movement to decrease in importance as employment and production in the state concentrates increasingly in product design. Alternatively, local product differentiation may require more goods production at a local level. Growth pressures from the urban areas into the Central Valley (the state's richest agricultural producer) may cause food production to move out of California in the long term. Such population growth, however, demands food consumption and, in turn, efficient means for food distribution.

Product innovation will remain important to California's economy. Technology and knowledge industries rely on face-to-face interaction, because people need other people they can create products with.

The long-term future in California also portends automation in transportation. Already automation plays a role in materials handling, and it will come for passenger travel as well.

Commentary

Edward Kawahara, Deputy Secretary for Economic Research and Strategic Innovations Division, California Technology, Trade and Commerce Agency

We have challenges cut out for California, both in current and future transportation demands. Our economy is going through a transformation, from a post-World War II defense-related,

agricultural, and natural resources-based economy to a "new economy" dependent on services.

The new economy is clearly electronic and Internet-based, and the Internet itself is predicated on innovation. Further, the new economy is global, which leads to demand for air transportation, and is dependent on much faster production and distribution, with region-to-region competition. Finally, California's new economy is characterized by networked clusters of activities, changed work habits, and rapid growth in the business services sector.

There is much we do not know about the new economy. How do we plan for air and space travel? How do we collaboratively plan among regions? Where do we make future investments? In the highways? In universal access to the Internet? Who should pay for new investment? These are questions and priorities we must seriously consider before we able to move forward with planning for statewide transportation investments.

Questions for Sessions I and II-A

Brian Taylor, Director of the Institute of Transportation Studies, University of California, Los Angeles and Associate Professor of Urban Planning: *Existing airports that need to expand have encountered considerable resistance from neighboring residential areas. At the same time, there is significant demand for commercial development surrounding airports. It seems as though local municipalities have not shown foresight in zoning the land around airports. Is there a way to resolve this?* **-John Kasarda:** Many airports around the country have implemented compensatory payment policies as they have increased their number of flights. Nobody is happy with that arrangement. Airports consider the policy is too costly, and residents often are not satisfied that they have been compensated adequately. The second point has to do with long-term planning with regard to noise contours. Land surrounding airports has lower prices that people buy for residences rather than commercial areas, but residential development does not achieve anything close to the optimal value or use for the land. It is incumbent on local areas to work with regions to avoid zoning that will over the long term conflict with the development of the airport, which is vital to the local economy. In developing countries, there is a bias against supporting airports as an economic strategy, even though airports have a fundamental role in developing economies. We have to put the airport in the broader context, as too often it is seen as a facility only for the elite.

B. Land, People, and Transportation

♦ 45 Million Californians in 2020: Where and How Will They Live, Work, and Travel?

John Landis, Professor of City & Regional Planning, University of California, Berkeley

California will have a population of about 45 million people in 2020. Ninety-five percent of them will live in metro areas (about the same as today), and 8 to 9 percent of available land will be urbanized, compared to about 6 percent today. Given wise planning (which may not be possible), there will be enough land in the state to accommodate critical natural habitats, farmlands, open space, and urban growth. Houses will get bigger, but lots will get smaller. Residential land uses will represent an increased percentage of the urban footprint, and jobs will continue decentralizing. What pattern job decentralization will take remains a question: will jobs disperse to suburban growth centers as in the Bay Area, or will the decentralization be more uniform, as in Los Angeles? Personal vehicles will remain the dominant urban transportation mode.

In the past, California has demonstrated remarkably uniform growth; the state usually gains about ten million people every generation. This rate of growth is likely to continue, with the state adding about five million people every ten years. Most of the state's growth will not be from immigration, but from natural increase. About half of the growth will occur in the greater Los Angeles region. Although the Bay Area will not grow as much as Los Angeles, it will also have a substantial population increase. Places like the San Joaquin Valley, the Inland Empire, and the Central Valley will have less absolute growth, but they will experience a high rate of growth, making the change in those areas feel more extreme to current inhabitants.

California has won the battle against "sprawl" defined as leapfrog development. Leapfrog development is characterized by low land utilization, landscape fragmentation, lots of edge development, expensive infrastructure, and polycentric job centers. Between 1972 and 1996, urban areas have not increased in size all that much. California's sprawl is more accurately characterized by the term "dense onion" than by the term "leapfrog development." Unlike leapfrog development, the dense onion has higher land utilization, lower landscape fragmentation, polycentric job centers, less cumulative access to open space, and increasingly overburdened infrastructure. In the dense onion model, each successive layer of the city has marginally higher densities than the previous layer, with smaller lots with bigger houses. From a state's perspective, the dense onion development pattern means that in general, urban growth is consuming open land at a slower rate than it would if densities were uniform for each successive wave of growth.

Dense onion development is happening all over the western United States, especially in Southern California. In these areas, many residents value their proximity to nature and open space. Open space becomes much less accessible, however, after layers of subsequent development occur around a residential area. The other big problem with the dense onion occurs when slightly higher densities for new layers of development use the infrastructure of previous layers that were developed to a lower build-out level. This is particularly true for roads, and less so for sewer and water. So older suburbs sometimes have less road capacity than newer suburbs, and therefore residents experience more congestion. Overburdened infrastructure poses a very difficult problem to overcome.

Other problems with new development in California persist. Nationally traded corporations have come to dominate California's construction industry. These companies are concerned about protecting their stock prices, so they construct large amounts of product (housing) on a strict time schedule. This requires standardized housing designs. Interesting or innovative building designs pose a risk that most companies will not take. Furthermore, public planning concentrates on impact mitigation, not on place creation. Much the new single-family and multifamily residential housing is unattractive and unwanted by high-income jurisdictions able to block development. Such resistance can thwart efforts at infill development designed to increase residential densities.

What might the future look like? A model developed by Landis found that, based on the past 25 years of urban development in California, land which is flat, close to a highway, and can easily be served by existing infrastructure will be developed first. Using this basic model, three development scenarios were developed for allocating residential population growth in 2020: one in which current trends continue (the baseline); one with compact growth, higher infill, and higher densities; and a sprawled scenario, with historical (low) densities and no growth occurring in high-income jurisdictions. Comparing the different growth scenarios shows that baseline trends matter tremendously. In San Bernadino, for example, the baseline is essentially sprawl development; continuation of the existing pattern of growth in this county demonstrates land-intensive development well beyond the existing urban fringe.

The potential for infill development exists. The barrier to infill development is not land supply;

rather, economics precludes much infill development. Many studies of infill in the Bay Area show great potential for "re-fill" development: renovating or rebuilding on sites where the existing structure is worth less than the land it occupies. About 90 percent of the infill potential in California is actually in re-fill development. For example, it may be possible to build another 17,000 housing units in Alameda County along transit corridors alone. Unfortunately, the number of units that could be built profitably is much smaller.

Barring substantial changes, these projections do not bode well for reducing auto dependency or alleviating congestion. All of the trends indicate increasing auto dependency, work trip congestion (since employment growth is likely to be decentralized), and congestion related to nonwork trips.

Despite these dire predictions, the projected increase in population provides some opportunities as well, such as the possibility for intensified development on commute corridors, some of which may be able to support investments in rail transit and/or bus service. At the same time, increased congestion will put a premium on sites near regional transit stations and stops. Increased use of regional transportation impact fees in fast-growing areas may provide funding for expanding capacity. The predominance of large-scale homebuilders should make it possible to promote or require improved pedestrian and bicycle planning. What is desperately needed is more attention to local subdivision regulations and coordinated site planning.

A continuum of strategies can help meet the future housing and transportation needs in California, ranging from market-oriented tools to regional collaboration. Market-oriented tools include full-cost pricing, impact fees, congestion and time-of-day pricing, and minimum-density requirements for transit stations to counteract NIMBYism. Regional planning could include collaborative agreements about the placement of new employment centers along existing transit and freeway corridors and regional transportation impact fees.

Regardless of the approach, good projects should be rewarded. The state needs clear, uniform, statewide standards for investing in projects. Mobility should be the primary concern in a growing state rather than trying to use transportation to fight sprawl. Much better tools for growth control (such as good site planning) exist for land management.

♦ Strengthening Transportation and Land Use Linkages

Robert Cervero, Professor of City & Regional Planning, University of California Berkeley

A different metaphor from the onion would be the artichoke, in which the center is the high value part of the vegetable, and it follows, in urban areas. Past analyses of compact development versus sprawl have considered only cost. However, there is research that demonstrates the benefits of alternative urban forms. For instance, the Bay Area has higher labor productivity in areas with greater accessibility. If California is going to make good decisions, we have to consider both costs and benefits of alternative urban forms.

Transit-supportive development includes strategic infill, adaptive reuse, and targeted infrastructure for shaping regional growth. Even though growth is coming, it need not be unplanned. Development could be better managed, like the Scandinavian model to use infrastructure to guide growth.

Predicted demographic trends do contain some potential stimulants for transit-oriented development. Immigrants from other parts of the world, where there tends to be a greater level of

transit use in the culture, are one demographic force in favor of transit. Baby boomers are aging and downsizing; this group, too, might be willing to consume less housing and more transit.

California also has some supply advantages for transit-supportive development. California is laying down more new rail than anywhere else in the country, and should make the most of the capacity it has built.

Also, an affordable housing crisis looms over California, and it is connected inherently to traffic congestion. Housing shortages and high prices drive people out to the fringe for housing, which increases traffic. Even if these households on the fringe can be served by commuter rail, they may be completely dependent on cars for nonwork activities. It is probably not optimal to have places in the East Bay desperate for housing development while young families are forced to live on the urban fringe due to housing prices.

Finally, public policies are for the first time receptive to transit-oriented development (TOD), such as incentives to developers for houses built near rail stops. Funding is available from both the federal government and the state so that transit agencies, municipalities, and redevelopment agencies can all form equity partnerships to absorb the short-term risks of infill and TOD that developers may be unwilling to take on alone.

People consciously choose to live in transit-oriented environments because they are drawn to an area where they will not have to commute. Only 10 to 15 percent of suburban residents might be willing to live in a transit-oriented environment. These will generally not be families with children; empty nesters, singles, and nontraditional households may be much more willing to occupy TODs. Pleasant Hill is an example of an area that over 25 years has pursued transit-oriented development policies. People live in places like Pleasant Hill because they are drawn to an urban area where they do not have to fight traffic. Their willingness to use transit, however, depends on the quality of housing.

Generally, planners do a bad job of conveying what is going to be done with infill. The reason that many communities respond negatively to proposed multifamily housing developments is that there are so many examples of poor design that people automatically assume the proposed multi-family development will be ugly as well. Compact development, however, can be quite attractive. Addison Park in Houston is an attractive area that typifies a mixed density of about 30 to 40 units per acre that have spurred significant bumps in transit ridership. We have evidence that proves at least some homebuyers will purchase dense housing as long as it is well designed.

Mountain View in California exemplifies infill and adaptive reuse development. In Mountain View, they took advantage of a new rail station to redevelop an obsolete 1970s shopping center surrounded by surface parking into a neotraditional neighborhood design with a good pedestrian access. The Mountain View development also used sliding-scale impact fees. Sliding scale fees reward developers who propose project designs that cause less strain on public infrastructure than would a different design that built the same number of units.

Other policies that promote infill and adaptive re-use include changes in federal policy. The Federal Transit Administration's common grant rules now allow transit agencies to keep the proceeds of a parking lot they have sold so long as the subsequent development is transit supportive.

Emeryville is perhaps the best example of infill development in a rapidly changing urban environment in California. They are pursuing a three-phase project using mostly existing industrial brownfields for adaptively reused office space. It is also a place where planners have

recognized that many destinations in the city can not be reached by transit. They have tried to use the "station car" concept to provide electric vehicles. Studies show that commute travel by car was in fact lower with station cars, but mid-day trips with autos increased as transit commuters used the cars for lunch-time errands.

A recent study has shown that land value increases with proximity to transit stations. In fact, the study found a $4.10 per square foot premium for commercial and office property within a quarter mile of a transit station. The land value benefits were even stronger in business districts near Caltrain stations, reflecting how employers in very expensive areas value their ability to draw workers from a large commuting shed. It is important that we document these types of benefits, because we have to 1) be able to convince developers that they can profit with TODs and 2) combat NIMBYism, lawsuits, and charges that proximity to rail has costs that exceed benefits.

In places like Tokyo and Osaka, we find that about 60 percent of suburban railway transit investment were built by privately financed franchises. These companies are rail transit companies in disguise; they are actually real estate investment companies that receive the majority of their profits from land development around the stations. These types of developments were common in the US one hundred years ago. It is time, perhaps, that we revive the idea in California, rather than separating the private land development decisions from public decisions about transit.

Finally, Stockholm provides a model of targeted regional investment which has created an impressive jobs-housing match. The model required planning public investment almost twenty years ahead of private demand. The rail investment guided land development. The result has been a radial urban form with very efficient bi-directional trip flows to support rail transit. The concept of regionally guided growth can work in California as well, especially in the Central Valley.

Market-based strategies can enhance regional planning. For example, location-efficient mortgages take into account that those who chose less auto-dependent surroundings spend less on automobiles and car travel. As a result, these households have more money for housing and wealth accumulation. Another pure market-based principle is getting the prices right in transportation. For example, Singapore's pre-purchased debit card allowed motorists to get the right information about how much their trip costs. Motorists there have legitimate alternatives to driving, so that citizens can make better travel choices based on the market prices they face.

For any of these strategies to work, evaluation in transportation has to improve. In transportation, we face a fundamental analytical problem: we have to forecast on past/current conditions that have been created by a misguided policy environment. We should look outside the United States at the development practices in other countries to help us analyze the consequences of fundamental changes in transportation and land use policy.

Questions for Session II-B

Unidentified participant: *Are personal vehicle miles traveled (VMT) or car ownership lower in locations near transit?* **-Robert Cervero:** Little rigorous research has been done on VMT for residents living near transit stations. Studies have been done that found people living near transit stations do have lower car ownership rates, even when we control for differences in income. One major problem is that public and private decisions do not reward people who live near transit. For instance, auto insurance rates may not be lower for those living near transit, even though they may use cars less. We are not providing strategic economic incentives to get individual private action in line with public policy goals. Also, we still insist on standard zoning, even when a mix of land uses would make far better sense near a transit station. In the case of the Pleasant Hill

development, one zoning/building concession that helped get the project off the ground was allowing the developer to go far below the usual parking standard based on the availability of transit. Even though today's discussion centered on transit, it is also possible for us to design development to make auto travel more efficient, such as aligning land uses for trip consolidation.

Unidentified participant: *How is it possible for the Department of Finance (DOF) to continue to predict millions of people being added to mature urban areas like LA County. Is it not possible in growth projections to account for land availability and build-out?* **-John Landis:** The model presented today uses DOF projections to 2025. The DOF model uses a demographic model based on historic rates of immigration and natural increase. Historically, immigration rates have been linked to job creation, so what the DOF projections assume is that jobs will continue to grow in California and provide an incentive for immigration. Some people have argued that California is not managing the growth well at all. They argue that our current land development strategies are costlier than in other places, which will eventually make California less competitive and steer the growth elsewhere. But we have no cases in California that prove this argument, where congestion or other ill effects of poor management have resulted in decreased growth. The other point to bear in mind is that California's growth is primarily driven by natural increase, not immigration. Chances are that natural increase will occur independent of economic cycles.

Unidentified participant: *Please address the relationship between high-speed rail or magnetic levitation rail and the dense onion or leapfrog sprawl patterns of development.* **-Robert Cervero:** It is very difficult to predict what effect the light rail system might have on development patterns. The question about high-speed rail itself speaks to the need for better inter-regional, sub-state coordination planning for growth. If we look at the Shinkinson system, it is estimated that about 7 to 8 percent of peak-hour riders are commuters. These are typically knowledge workers who live very far away from their jobs. These are workers who have the greatest ability to decentralize their home and work locations. They telecommute most days and then only come in to their offices two or three days a work. High-speed rail could open the Central Valley to the same decentralized residential development. What is needed for high-speed rail to be truly effective are institutional relationships that can plan and design effectively for the land surrounding the rail stations. **-John Landis:** Rail investments in the Central Valley are a good idea. The growth in the Central Valley really does represent a sea change, where our old assumptions about growth do not apply. But the question remains, should we put in commuter rail, with relatively few stops (and therefore limited ability to affect urban form) or a higher speed commuter rail system. Coastal areas will get more expensive and the inland areas will continue to be the cheap place for people to live, and they will need to be linked to the coastal areas. If the growth that occurs inland turns out to be high-end business services that require face-to-face communications (such as hopping on the train in Bakersfield and hopping off in Sacramento), then we should go with high-speed rail if there is sufficient demand. But if that's the case, asking the general population of California to subsidize a very expensive service for businessmen is problematic. Raising the level of service on existing commuter rail corridors could really increase the size of the commute shed, be cheaper, and have more frequent stops. We have to think these possibilities through. **-Robert Cervero:** Some high-speed rail/business campuses are having trouble distributing people through the Silicon Valley once they get off the train. We have had an explosion of people parking a second car parked on the local streets in Sunnyvale. They drive during the middle of the day, then they leave the car, get back on the commuter rail, and go home. Parking structures have had to be built to accommodate those cars. We can have all the mainline heavy rail in the world, but without adequate feeder and distribution services, we still get the car-related problems. **-John Landis:** Where the next generation of job centers, and what form they will take, remains a major question for high-speed rail. In the past, private decisions have determined where job centers will be. Given the growth we expect, it may be time for government to be more proactive about directing the where new job centers locate.

Therese McMillan, Deputy Director of Planning, Metropolitan Transportation Commission: *Both of you mentioned the distorting effects of housing prices in California Is there any correlation between the housing affordability and leapfrog sprawl?* **-John Landis:** We have in previous work found that the very high-income communities are not taking their fair shares of housing in any sense. Also, many high-income communities are not the farthest-out; they tend to be older, established places. This displaces affordable housing even more, causing longer and longer commutes. But densifying high-income communities is not a politically winning strategy. **Therese McMillan:** Cervero discussed his efforts at modeling land values near transit stations. Do your models suggest that there must be a complementary set of land use controls in order to realize those land value benefits? **-Robert Cervero:** In the Scandinavian model, the public sector had to step up and play a much more proactive role advocating for controlled development by using metaphors that people could relate to like "pearls on a string" to for clustered development. It also involved advanced right-of-way reservation. But there is a larger role for the public domain there; they reward "good" development through tax policy, for example. The new towns there are not necessarily filled with nice architecture, but they are very well-balanced in terms of transportation. People there do have cars, but their use is more judicious and selective thanks to their guided urbanization

C. Demographic Trends and What This Means for Transportation Planning

♦ Transportation Issues in Low-Income and Immigrant Communities

Abel Valenzuela, Director of the Center for the Study of Urban Poverty, and Associate Professor of Urban Planning, UCLA

In looking at the California's poor and minority residents, five key facts emerge: 1) The numbers of poor and minority residents are significant; 2) These groups are key to California's prosperity because they fulfill service positions; 3) They are not just an urban population; they are, in fact, found throughout the state; 4) They span different races and ethnicities; and 5) They are largely ignored in major policy plans, and discussed only in welfare or social policy reform plans. Their inclusion in California's statewide transportation plan would be innovative.

Back in 1970, only about 9 percent of California's residents were foreign born. By 1990, the number had risen to 22 percent. If this trend continues, the foreign born will represent an increasing percentage of the state's population. Poverty is a serious problem for foreign born residents. The poverty rate is 1.4 times higher among foreign-born persons than among the native-born. The percentage of foreign-born poor who live in poverty has grown from 15 percent 1970 to 20 percent in 1990. About 4.8 million Californians currently are poor, about 14 percent of the general population. The poverty rate is 1.4 times higher among foreign-born persons than among the native-born.

The rate of poverty varies significantly among the foreign-born. The poverty rate is 28 percent among those who have been in the US for less than ten years. Over time, foreign-born persons tend to become more affluent; the poverty rate is around 9 percent for those who have lived in the US for more than 30 years. Second-generation Americans are three times as affluent as new arrivals.

We see very similar trends in public transit use. Transit use is comparatively high among those who have recently immigrated to the US, but it diminishes with years of residence. California's current experience with immigration is remarkably similar to past experiences. For example, day laborers who line the busy intersections of Los Angeles and New York today are very similar to Italian and Irish immigrants who lined up near docks, picking up work when and

where they could, earlier in the century. Immigrants have always adapted to and influenced the host society. Transportation is a perfect case in point. Like most people, many immigrants rely on cars. Unlike most people, however, immigrants have a high propensity to use myriad alternative modes of transportation to access to difficult-to-reach places and mainline transit services, as well as to defray travel costs**.**

A good example is the bicycle and its growing importance as a commuter mode among immigrants. A recent article in the Los Angeles Times showed that low-skill workers rely heavily on bicycles because they are unlicensed, are unable to take the bus, or need the flexibility the bicycle offers. Those relying on bicycles are often night workers—such as janitors or dishwashers—who need to get to work long after the last bus, or they may be undocumented workers unable to get a driver's license. But bicycle commuting in LA has proven dangerous. During the evening rush hours, a bike ride can take about 90 minutes for a six-mile trip. Adult bicycle fatalities have risen by 20 percent in the past five years. From 1998 to 1999, fatal bike accidents involving adults doubled. The need for safe, accessible, and friendly bike paths to serve immigrant populations is becoming increasingly apparent, yet the resources devoted to bicycle facility development remain discouragingly low.

In addition to providing resources for bicycle commuting, planners should observe how foreign-born residents adapt to the limits of current transit system by using stopgap modes; this provides potential insight into the benefits of alternative modes and different methods of routing and scheduling.

Small vehicle services and motorcycle taxis are two entrepreneurial transportation innovations that serve low-income, immigrant-rich communities. One example is the raiteros industry, which provides intercity transportation between border cities in Mexico and Southern California. The raiteros industry provides minivan or van service to both legal and undocumented Latino riders for intercity and transnational trips. The majority of the operators are unregulated, and they operate primarily in major metropolitan regions with large immigrant populations. Raiteros firms stake out routes in an entrepreneurial way; some serve primarily border cities such as San Diego, while others make long-distance trips across the US.

When interviewed, passengers reported that the raiteros services provide a higher comfort level than traditional intercity providers for cheaper rates. Also, customers often perceived Greyhound drivers as discriminatory and rude. Furthermore, raiteros services are able to go into areas that other intercity services do not, and they can change their routes easily, like taxis. Both long and short-haul raiteros services are usually found not far from traditional Greyhound stations. The minivans used by some raiteros services take advantage of the anonymity that the van provides. Planners can learn from the market regarding the needs of these riders; the lesson from the raiteros industry is to support creative and flexible policies that enable entrepreneurial transportation modes.

Immigration status is only temporary; immigrants often become very much like the rest of the US population once they have been here for awhile. Less clear, however, are the needs of those who remain poor or those who are not immigrants and who are poor.

Transportation is central to class outcomes for immigrants; it is crucial to think about the mismatch between where people live and where they work, and how welfare-to-work programs address this mismatch. The mismatch thesis argues that unskilled workers are especially disadvantaged by housing discrimination. But research by Paul Ong and Brian Taylor has shown that private vehicle ownership equalizes average commute duration between and among socio-economic groups. Car ownership for those with low incomes opens myriad new opportunities for

bettering their economic outcomes.

The other important issue is welfare reform and poor people moving from welfare to work. The availability of daycare for children is critical for such households. Other household activities likewise call for unique approaches for transportation. For poor households, shopping is often time-consuming, difficult, and expensive, as those without cars who need to purchase basic necessities often have to choose between shopping at local mom-and-pop stores with high prices or making time-consuming trips to discount stores farther away.

Questions for Session II-C

Unidentified participant: *Is it socially responsible to advocate car ownership for the poor? Shouldn't transportation policy favor transit over privately owned vehicles? The poor often will not be able to afford their vehicles' maintenance. Also, advocating car ownership for the poor ignores the persistent problems with air quality we have in California.* **-Abel Valenzuela:** It is possible to subsidize operating expenses for cars as well as for transit. Once a person has a car, it is much easier to keep a job that can help pay for the car.

Unidentified participant: *One comment and then a question: as long as we in the middle class have two or three cars, and even our children have cars, we can not go preaching to the poor that they should go without a car for the sake of the environment. My question: can you talk a little about the development of jitney transportation in California?* **-Abel Valenzuela:** Jitneys have an interesting relationship with regulated bus services. They coordinate with existing Spanish-speaking companies and sell tickets for those services. They also find passengers for half-filled buses and provide feeder services for mainline services. There is a remarkable level of organization in what appears to be chaotic system. They also have a very sophisticated pricing structure.

Unidentified participant: *How do you suggest helping immigrants and the poor turn into advocates for themselves*? **-Abel Valenzuela:** Many instances of community organization are evident; the Bus Rider's Union and the Justice for Janitors group are two key examples. One way for public agencies to help is to provide bilingual materials for their own services and be more willing to coordinate their services with unregulated, entrepreneurial services, like the raiteros firms.

D. Serving Our Many Populations: Equity Issues in Transportation Policy

Moderator: **Brian D. Taylor** (Director, Institute of Transportation Studies and Associate Professor, Urban Planning, UCLA) Panel: **Luis Arteaga** (Associate Director, Latino Issues Forum); **Jerilyn Mendoza** (Staff Attorney, Environmental Justice Project Office, Environmental Defense, Los Angeles); **Audrey Straight** (Senior Policy Advisor, Public Policy Institute, American Association of Retired Persons); **Alan Toy** (Project Director, Living Independently in Los Angeles, Advanced Policy Institute, UCLA School of Public Policy & Social Research); **Margy Waller** (former White House Senior Advisor for Welfare and Working Families).

Brian Taylor: The discourse on transportation funding has always centered on equity. In public finance of transportation, how we pay for and provide services has been predicated on equity from the beginning. The concept of what is fair, however, has evolved and expanded over time. A variety of factors—process, service quality, who bears the costs— now inform our perceptions of equity in transportation. Different agencies at different levels of government, as well as different individuals, have understood equity differently. What one group views as equitable, another may view as unjust. But both may be valid ways of interpreting the same decision or outcome.

In general, there are three types of equity. Market equity requires that we bring prices in line with the benefits a user derives from the facility. Opportunity equity says that individuals should have relatively equal chances to use resources. Outcome equity means that resources should be distributed equally. All of these are different perspectives on what is fair in the public realm.

In analyzing equity, the unit of analysis matters tremendously. Geographic area has been one prominent unit of analysis; historically, equity discussions have focused on geographical distribution, such as with donor and recipient states in the federal distribution of transportation funds. At the individual level, it is possible to distinguish what is fair between residents, voters, and travelers. Among groups, there are modal interests, such as bus riders and peak-hour car commuters, and racial and income interest groups. Each of these groups maintains a different position on equity in transportation outcome, finance, and opportunity.

Combining different types of equity with different units of analysis provides many possible kinds of equity. This complexity explains why equity is a difficult concept to measure.

Luis Arteaga: Another way to look at the issue of equity is in governance and decision making. Who's asking and answering the questions? We take for granted representation on boards and advisory committees, but when we went to the Bay Area and looked to see how many Latinos were sitting on boards, only nine of 143 seats were occupied by Latinos, and those were concentrated in San Francisco and San Jose. Representation just did not exist in outlying areas like Napa, Sonoma, and Solano counties. By examining representation, it is vital to get beyond surnames into who actually speaks for a community. Planners and decision-makers get nervous about increased public participation. But many agencies are relatively obscure, and many citizens do not know what these agencies are doing, who they are, and whose interests they serve. When agencies actually open up their processes, they build legitimacy. Serious input from constituents is possible and potentially very rewarding.

Audrey Straight: In terms of the elderly population, it very difficult to decide what is fair in terms of resources. Age in transportation is really a proxy for health issues, and health affects individuals' mobility. The Association of American Retired Persons (AARP) has a policy to encourage local governments and transportation planning agencies to make sure that older persons are included in the planning process. There should not be much competition, in terms of equity, between groups. If we make sure everyone has access, the equity issues will be resolved.

<Because he was in his wheelchair unable to access the dais, Toy spoke to the audience at floor-level, four feet below the other panel participants.>

Alan Toy: The absence of a ramp to make the speaker's dais accessible does a fine job of illustrating the breakdown in coordination that can occur when attempting to provide access to persons with disabilities. The Americans with Disabilities Act (ADA) provides for equal rights and accessibility to person with disabilities, but the provisions of the ADA require forethought and additional financial resources. Ramps, rebuilding, and accessible buses cost money and time. Persons with significant or severe disabilities were 8 to 10 percent of the US population in the 1990 Census. People with the severest disabilities often have the most impact on the transportation system. There are many sensory disabilities among severe disabilities, and there are also those who have transit adaptation issues. The options are buses, fixed-route transit and complementary car transit for those who unable to use the fixed-route systems. In Los Angeles, we have the Metropolitan Transportation Authority and Access Paratransit Services. Access Paratransit for the first four years of operation was found to be a "phenomenal" operation in an evaluation performed by consulting firm Booz-Allen Hamilton . It carried 1.6 million riders last year at a cost of about $46 million. However, last year Access was sued even though it was

supposedly doing so well. Ten percent of riders do not get picked up in a timely fashion. So a spate of issues creates an extreme challenge to persons with disabilities and agencies trying to serve them, including the quality of transit adaptations, equipment malfunctions, and drivers driving past persons in wheelchairs at bus stops because the bus does not have the capacity to stop for a disabled passenger.

Jerilyn Mendoza: There are numerous transportation barriers in Los Angeles. According to an article in the Los Angeles Times, as many as 450,000 people in Los Angeles depend on transit every day. Spatial mismatches make many jobs out of reach for poor people. The Los Angeles Metropolitan Transportation Authority (MTA) has been operating under a consent decree. Despite improvements, it still has overcrowded buses. A recent Supreme Court decision undercuts the basis for the consent decree. There are three main rail lines in Los Angeles that are not as flexible or as heavily used as the buses, but they are more expensive to construct and operate. Walking and biking are unsafe, but less than one percent of the MTA budget is set aside for bicycle or pedestrian safety. Pedestrians have a hard time navigating streets built for speed. A disproportionate number of low-income people get killed or injured due to poor pedestrian and bicycle accommodation.

Lack of access in transportation equates to lack of access to opportunities. We need the increased use of rapid bus lines, and better pedestrian and bike safety. If air pollution is a concern, we could subsidize electric vehicles for low-income people.

Key to improving transportation planning is to engage the low-income people who are affected by these decisions. This ensures that their transportation needs are addressed while tempering the continued focus on high-speed streets. We need education and outreach to help low-income people to get involved in improving their transportation options; just putting out a message about a public meeting is not enough.

Margy Waller: People who do not have cars face steep challenges. There are ways to get poor people better access to cars, which is a policy response that few have used - and those few programs that have tried subsidizing cars have not faced much heat for it.

The first thing that California can do is change the vehicle asset limit. It was formerly $1,500, and then it was raised to $4,650 under the food stamp program. States now have the option to eliminate vehicle asset limits under welfare reform, and they should. State Assembly Bill 144 would do something like this for California.

The second option is to use welfare dollars more flexibly. Block grants can go to support transportation for people who are working but struggling. California has not been particularly creative in this area. The state has a limit on how much assistance can be provided, and it is a county-level decision. Block grants could be used to buy and/or maintain cars, and pay for insurance, driver's training, or commuting costs. Currently, California has a rule about how counties should make a decision about this: if public transit is available, and the ride is less than two hours round trip, then the county can only provide the cost of public transit and not the full cost of using a car. This rule is in no way supportive of low-income family life.

Third, legislation pending in the California Assembly would provide support for all families below a certain income level. The state could use matching grants on the Individual Development Account (IDA) model. One problem with this idea has been that those who run IDA programs want recipients to build up appreciable assets, and they do not see cars qualifying.

A last thought, on public transit versus cars. Clean air, sprawl, and congestion are worthy

concerns. Should we solve these problems on the backs of poor working families?

Audrey Straight: It should be remembered that buying cars is not going to work for the older population. But road design can make driving easier for older drivers, as can improving the fit between older people's needs and transportation services.

Questions for Session II-D

Martin Wachs, Director of the Institute of Transportation Studies, and Professor of City & Regional Planning and Civil & Environmental Engineering, University of California at Berkeley: *It seems completely inappropriate to say that we should subsidize or should not subsidize cars or transit. Why should we subsidize people at all with respect to mobility? Why do we presume that particular people are transit-dependent among the poor? There are probably many more people who are auto-dependent. A statewide plan must consider all forms of mobility and should not begin with a presumption that one thing should be subsidized over another.* **-Alan Toy:** For those with disabilities who are transit-dependent, modal options are not really the issue. The availability of transit is the difference between access and isolation.

Robert Cervero, Professor of City and Regional Planning, University of California at Berkeley: *Is it possible to exploit the possibilities of providing mobility for the poor through economic development? It is estimated that in some places mobility production is about 35 percent of the economy. Community-based mobility organizations, in combination with deregulating alternative transportation, are also a possible solution.* **-Margy Waller:** A variety of paratransit services exist around the country, some entrepreneurial for-profit and some non-profit. But these services have faced difficult problems because of the work characteristics of the people they were providing service for: odd hours, on-call schedules, changing hours, and the need for child-care arrangements. As a result, it may not be the best approach. We recommend combining an on-demand transit system with public funds.

Brian Taylor, Director of the Institute of Transportation Studies, University of California, Los Angeles and Associate Professor of Urban Planning: *Among people who have a driving obstacle, the vast majority get rides with other people. All of the specialized programs that planners work on serve a very small number of trips in comparison with the number of rides that people arrange informally. The 1995 NPTS found that over 80 percent of workers in households living in poverty get to work in privately owned vehicles, and 60 percent of them drive themselves alone to work. Meanwhile, the median household income of transit riders was below $20,000 a year. Big-city transit is a service for the poor.* **-Audrey Straight:** A person getting rides from other people is one solution. But people do not like feeling dependent. They will not ask for rides unless they absolutely need to, and that reduces their access and quality of life.

Brian Taylor: A task force in Los Angeles came out with ten proposals related to welfare-to-work transportation policy. Some activists tried to get direct subsidies for car ownership, but staff believed it was not politically viable and would not get support from county supervisors.**-Margy Waller:** There is evidence that states are supporting car purchase and car ownership for those making the transition from welfare to work, and many conservatives support the idea.

Friday, June 22

Session III. Meeting the Challenges of the Future

A. Designing Transportation Strategies and Planning Processes For Addressing the Several Challenges Confronting and Changing the Nature of California

Moderator: **LeRoy Graymer** (Founding Director, UCLA Public Policy Extension Program). Panel: **Mark Pisano** (Executive Director, Southern California Association of Governments), **Carolyn Ratto** (Senior Mediator, California Center for Dispute Resolution), **Brian Smith** (Deputy Director for Planning and Modal Programs, California Department of Transportation), **Anya Lawler** (Policy Analyst, Governor's Office of Planning and Research).

To begin, two questions were posed to the panel:

- What are the important institutional and structural issues in designing transportation strategies and planning processes for California? How should we work within the complicated federal, state, regional and local system?
- How do you involve the many different policy leaders and governmental entities in the transportation planning process?

Mark Pisano: In a fragmented, special-interest-oriented world, there is no substitute for a table large enough to accommodate all the parties involved in a particular planning question. A large communication network is also necessary. For example, at the Southern California Association of Governments (SCAG), our board recently increased in size from 21 to 76 members.

We also need to think about the psychology of the individuals to whom we are trying to provide service. People do not understand today's rapidly changing world, and they feel isolated. They cannot see how their actions relate to one another, and they do not think about what is going on with their neighbors. In transportation we exacerbate these problems by planning project by project and mode by mode, without developing a capacity to look at the whole system.

Carolyn Ratto: When seeking short-term solutions to transportation problems, we often focus on policy leaders and governmental entities rather than carry out a truly inclusive process. Funds have to be allocated in a certain amount of time. Often, as much as elected officials and policy leaders would like to be thinking long-term, reality dictates that they have a more short-term vision. This leads to disjointed projects and a lack of coordination. We must acknowledge these political and financial realities when carrying out a long-term state planning process.

The distinction between positions and interests should also be acknowledged. People usually come to the table with a position. For example, a position is: "I want eight lanes of freeway in my community." The interest there might be: "We need more efficient goods transportation in our region." Those are two very different places to start from.

Mark Pisano: We tend to advocate various transportation projects—those are positions. But our real interests are outcomes, not projects—what are we trying to accomplish in society? The public does not understand eight lanes of freeway. They do understand getting to jobs, being safe, having clean air, and concerns about equity and fairness.
LeRoy Graymer: Brian, how do you address these institutional questions? \

Brian Smith: California's transportation system is linked to the fabric of its economy. Therefore

we need to combine transportation planning with planning for housing, economic development, and natural resource conservation. The process should include creating partnerships between the state and local jurisdictions, finding projects and services that can leverage funding sources, and getting locals involved as stakeholders.

We are trying to carry out a comprehensive statewide planning process with a set of planning, decision making, funding, and programming and delivery institutions, and environmental protection mechanisms, that were developed in the 1960s and 70s. It is worthwhile to question whether current institutional relationships meet the test of speed, agility and added value.

Carolyn Ratto: Creating new institutional arrangements can be problematic. There is not a one-size-fits-all solution to any problem, particularly in a state as large and diverse as California. In the Valley, issues of air quality and traffic congestion are highly connected to the Bay Area. But if we are talking about agricultural transportation, then the boundaries are very different. The boundaries for good regional planning for one issue may not be the same as for another.

LeRoy Graymer: Anya, what would you like to add?

Anya Lawler: We have come a long way in the past twenty years in developing more flexible funding sources, but we need to become more flexible in how we allocate those funds.

Recently the Governor's Office of Planning and Research has been holding a series of stakeholder meetings in different regions of the state. It was amazing to see that diverse stakeholders—developers, business people, community advocates—did have the same interests and care about the same outcomes. But they all have different beliefs about how to get where we want to go.

LeRoy Graymer: Brian, could you discuss outreach in the planning process?

Brian Smith: We need to engage both nontraditional customers and traditional stakeholders. The DOT recently conducted a survey and some focus groups. People want a transportation system with diversified options and convenient mode transfers. They want us to use technology to make transportation more efficient and safer, and to speed the delivery of products and services.

We are developing a limited number of themes for the state transportation plan: mobility choices, a safe trip, system reliability, and respect for community values and the natural environment. We have been considering a number of strategies. We will be taking a more aggressive role in transportation decisions whether they are under our control or not. We will pursue flexible funding in order to enable the right decisions. We will employ technology to improve the system. We will pursue better integration of land use planning and transportation planning. And we will continue conducting forums with academics, practitioners and the general public.

Mark Pisano: The state plan should take into account the fact that there are different borders for different problems. Right now we have a limitation that state plans cannot have projects in them, and there is no relationship between state plans and what projects are funded. Often at the regional level we also treat programming as planning. This prevents us from looking at outcomes. For example, in California we have been debating high-speed rail without discussing its relationship to a state plan, to aviation, or to growth.

Carolyn Ratto: There are two distinct outreach processes that have been alluded to today. The first is a focus group effort, which helps policy makers to understand interests and concerns, and is best used for short-term goals. The second is a true collaborative process, which can take

between five and eight years. This starts with an assessment phase, to determine which groups should be at the table and who has authority to speak for each group. Then there is an organizational phase, in which you determine the ground rules of how to operate, meet, and behave with one another. Then there is a formal and well-orchestrated educational phase. This is where many collaborative processes break down, because negotiating over desired outcomes, and strategies to achieve them, requires a common language. Finally, to avoid the plan being put on the shelf, an ongoing monitoring effort is needed, and it needs to be flexible enough to change to reflect conditions.

LeRoy Graymer: Can Brian and Anya speak about the state engagement in this process?

Brian Smith: The California Transportation Commission does not decide upon a real plan, but upon a program of individual projects. Under SB 45, the Commission looks at 25 percent of the STIP. The other 75 percent is presented by the regions, and the Commission's latitude on that 75 percent is pretty small. It can either reject or accept a regional set of projects (a TIP). There is a need for a better articulated and outcome-oriented state set of policies and actions.

Anya Lawler: OPR is statutorily responsible for developing a document called the State Environmental Goals and Policy Report. The document does not exist. If we created it today, the STIP would not necessarily have to conform with it. In contrast, the state of Maryland has a strong smart growth plan. The government draws circles around certain areas and says it will not fund infrastructure there. California is politically fragmented, lacking mechanisms for this kind of plan.

Another responsibility of OPR is to coordinate statewide planning at the agency level, making sure that departmental and agency plans do not contradict one another. This has been left by the wayside in previous administrations, but is something that OPR is heavily involved with now. We are working closely with Caltrans on the transportation plan, along with the update of the state water plan and the housing plan. When all of these departments have different goals, it is difficult to target funding in a cohesive and financially constrained way.

Mark Pisano: Many problems arise in our regions because we do not have coordinated state agencies and goals. In SCAG's last transportation plan we had to plan to reduce the region's output of reactive organic gases by 17 tons. We found that growth management could achieve 12 tons of this reduction. Furthermore, we found that one change in state housing policy could have a greater effect on VMT and emissions than the entire transit program. Other than the housing element of local general plans, we have no provision in state law requiring that city or county activities have to conform with regional or state policies.

Brian Smith: There are many ways that Caltrans could spend its 25 percent of the STIP. We could have a list of projects from the regions, prioritized by political pressure. Or, we could have an interregional transportation system strategic plan that lays out some guiding principles. We could go beyond that, and prioritize projects that produce certain kinds of outcomes.

Priorities could include completing the focused-route trunk system to improve interregional movement of people and goods. We could also work with regions to reduce congestion and promote livable communities by leveraging funding to complete projects in the Governor's traffic congestion relief program. We could invest in projects where there is integrated land use and transportation planning. For example, we could prioritize HOV projects in areas where there are comprehensive bus rapid transit systems that can make maximum use of them. Finally, rural areas cannot be ignored. Areas with a combination of local rural travel, recreational travel, and agricultural transport are a concern for the entire state.

Mark Pisano: Another piece of information that has to be on the table during a collaborative process is the true costs of each decision. Not just the grant or capital expenditure cost, but the operating and maintenance cost, the externality costs, and the benefits.

Questions for Session III-A

Chris Williamson, Associate Professor, University of Southern California School of Planning*: What works in other places that we can look at, what does not, and how do we capture some of that instead of trying to reinvent the wheel? Also, it seems that we are reacting to things, rather than taking a more pro-active approach and setting the agenda*. **-Anya Lawler**: At OPR, we've just finished an exhaustive study of housing, transportation, and growth management in the other 49 states. **-Mark Pisano**: The SCAG approach is modeled after the city and state of Tokyo. Shanghai is doing something similar. Secondly, goals and visions are very important parts of our planning process. When we can capture the dreams of people, we can capture their wallets. **-Carolyn Ratto**: Sometimes "proactive" and "reactive" mean long-term and short-term. To have proactive planning about energy in California, for example, we need people involved who are in for the long haul.

Waldo Lopez, Director of Economic Research, The Tomas Rivera Policy Institute, Claremont Graduate University*: What is the status of the jobs-housing balance policy in SCAG's transportation plan?* **-Mark Pisano**: SCAG plans a growth distribution that moves the region more towards balance, and has reduced our anticipated air quality emissions by 12 tons. **-Anya Lawler**: There was $100 million in last year's state budget to promote jobs-housing balance, and there will be at least another $100 million this year. **-Brian Smith**: Jobs-housing imbalance is a quality of life issue. We need to make the transportation-related consequences of land use decisions clear to local entities making those decisions.

Steve Goetz, Principal Planner, County of Contra Costa Community Development Department*: The Department of Education tells us how to construct schools, and this is done without a relationship to local planning, creating transportation problems. Is OPR looking at these regulations?* **-Anya Lawler**: Yes.

John Kasarda, Professor, University of North Carolina*: Airports are often viewed as tools of the elite. Is there an appreciation among planners and high-level officials of the critical role that aviation plays in the prosperity of the state?* **-Mark Pisano**: Our transportation thinking has taken into account the importance of aviation. SCAG has a decentralized aviation strategy reinforcing the growth plan mentioned earlier. **-Brian Smith**: Airlines and air cargo carriers decide where they are going to operate. The state role has been somewhat limited to general aviation, safety issues, and noise issues. But there is a regional and statewide interest in how airports operate.

B. Sustainability Strategies for Protecting Natural Resources While Enhancing and Maintaining Mobility: Protecting Quality of Life Through Policy Harmonization and Incentives

Moderator*:* **Elizabeth Deakin** (Associate Professor of City & Regional Planning, UC Berkeley). Panel: **Michael Sweeney** (Undersecretary, California Resources Agency), **Joan Sollenberger** (Chief, Division of Transportation Planning, California Department of Transportation), **James Corless** (California Director, Surface Transportation Policy Project), **Julia Greene** (Executive Director, San Joaquin Council of Governments), **Honorable Robin Reeser-Lowe** (Mayor of Hemet and participant in Riverside County Integrated Plan).

Michael Sweeney: How do we help decision makers decide how to allocate scarce conservation

resources? The Resources Agency has recently developed California's Continuing Resource Investment Strategy Program (CCRISP). The program will identify the state's threatened and endangered species, environmentally sensitive areas, and important landscapes, and will make that information available to decision makers within and outside government. If we do a good job sharing this information, we can help people make good policy decisions.

We have also entered into a special agreement between Secretary Mary Nichols at the California Resources Agency, Secretary Maria Contreras-Sweet at the Business, Transportation, and Housing Agency, and Secretary Winston Hickox from the California Environmental Protection Agency. The agreement addresses how to carry out transportation projects that are good for the environment. We want to engage in collaborative planning from the beginning so that we can identify problems that certain projects might have early on. This would give Caltrans useful information in making decisions about what projects to pursue, and what projects to cut loose at an early stage. On our end, the EPA and the Resources Agency are frequently criticized for not being timely in our comments. So we need to work at providing better customer service to the transportation agencies.

Early consultation and collaboration, and the use of good scientific information for decision making, are important. To the extent that people get together early in the process and have the best information available on which to base their decisions, the possibilities for better outcomes are much improved.

Joan Sollenberger: We are pleased that state agencies are coming together to make progress on addressing these early coordination questions. We have been having trouble with project delivery because concerns come up quite late in the development or construction process. As a result we are not being responsive in finding effective solutions to transportation problems. Not having a regional perspective, or failing to take into account the larger interests and needs of the state, causes further delays. Finally, the state agencies all have different missions. Caltrans's mission is to provide mobility for California. The Resources Agency's mission is to protect natural resources. Understanding these potentially conflicting missions brings us closer to harmonizing them. Also, planning processes are critical to ensure that constituents do not feel disenfranchised.

We are very supportive of livable communities concepts. The Governor's Office of Planning and Research does have a state agency working group on smart growth. We are working with housing and community development on how to provide incentives. We have livable community grants, and we have an alternative transportation livable communities working group with the STPP, the Rails-to-Trails Conservancy, and the California Bicycle Coalition.

Robin Reeser-Lowe : In Riverside County, there are over 20,000 acres of wetlands, 194 species, and a lot of people. We have over 300,000 acres that are set aside either by the Bureau of Land Management, the Forest Service, or the Department of Fish and Game. The Riverside County Conservation Agency has spent over $120 million to preserve one species in our county, which is a problem. But we are identifying as many species as we can in our county, and addressing how economic development, transportation, general plan amendments, and people can live together.

Our county has two to three million people, and will double in size in the next 15 years. Base closure hit the area severely, with cities on the brink of bankruptcy. Transportation problems are also increasing. We set about eighteen months ago to find a solution, which became known as the Riverside County Integrated Plan. It is a combination of city and county officials working together with federal agencies, state agencies, local environmental groups, the business community, and the Building Industry Association to find a solution. Last year we signed an agreement with the federal government, the state agencies, and all of our county agencies that

will assist with the plan and fast-track this process.

One committee is the Community Environmental and Transportation Acceptability Process, which I chair. The committee includes people from agriculture, the Sierra Club, the Building Industry Association, endangered species groups, landowners, and others. We now have a first draft of a plan, and most of the parties are still at the table, which is the first time in Riverside County that has ever happened. We have also cooperated with Fish & Wildlife, the EPA, and the Army Corps of Engineers from the beginning.

Julia Greene : Seven years ago in San Joaquin County property rights were coming into conflict with endangered and threatened species protection. The San Joaquin Council of Governments accepted a challenge from our local governments and began a process that led to the San Joaquin Multi-Species Habitat Open Space Plan, the most comprehensive plan of its type in the country. It protects 97 endangered and threatened species countywide, and provides us with development permits from both the US Fish & Wildlife Service and the California Department of Fish and Game. Anybody who wants to build is automatically cleared as long as they mitigate according to the plan. We've already done the biological analysis and the studies for developers, and we know where the species are. Developers can pay the fee identified under the plan, or can elect to go to the Fish & Wildlife Service and negotiate directly.

You definitely have to have a big table to try to do something of this magnitude. We brought in the builders, the business community, the chambers of commerce, the environmental groups, the League of Women Voters, the Farm Bureau, all these disparate groups. Through that seven-year process, we came up with a plan that covers urban development, urban boundary expansion, and non-agricultural activities occurring outside of urban boundaries.

Also, the plan addresses the issue of preserving open space in our county. We are fast becoming a bedroom community of the Bay Area. But more than 100,000 acres will be open space in 50 years thanks to this plan. We worked very carefully with landowners and bought an extra 10,000 acres on top of the 100,000 set aside in order to buy neighborhood landowner protections so that endangered species roaming outside their normal range do not threaten landowner property rights.

Two-thirds of the cost of the plan will come from developer fees. Another third of the money comes from donations from the state, federal government, and foundations. The Council of Governments has incorporated itself into a nonprofit, which allows people to donate land and get a tax write-off. Our Technical Advisory Committee will help guide this process as we purchase our preserves in a very comprehensive manner.

Finally, I would encourage people to look outside boundaries for solutions. We recently developed a five-county interregional partnership among three councils of government, five counties, and ten cities to deal with the jobs-housing balance issue.

James Corless: People are starting to think differently about how to protect the environment and have a sustainable transportation system, quality of life, and economic growth. Technology cannot do it all. For example, electric cars will not solve congestion problems.

Environmental problems are not simply a function of population growth alone. For example, only 13 percent of increased congestion in California is attributable to population growth. The rest comes from people driving more frequently and for longer distances, and declines in average vehicle occupancy. These trends are due not only to lifestyle changes but also to the development pattern, which is the critical piece for planners.

The predominant development pattern in California has significant consequences for transportation. Two-hour commutes are just as much a housing issue as they are a transportation issue. This is why we need interagency cooperation, and why we need to link transportation, housing, and land use policies.

There are many examples of the importance of land use to transportation outcomes. Work trips and shopping trips used to be distributed around road networks that consisted of connected grid systems. Now we have low-density single-use development. When uses are separated, we get no benefits from density. Unconnected roads cause lower capacity, fewer route choices, and longer trip distances. If we are going to try to protect open space, natural resources, and agricultural land, we have to build better urban form. We must place priority on things like pedestrians and walkable environments. And transit plays a critical role in California, where there are seven times as many public transit riders every year as there are airline passengers out of every major airport. Only 63 percent of our population is licensed to drive, ranking California close to the bottom, and that number is declining every year.

Transportation expenditures are higher for families in California than energy, education, and health care combined. In Bay Area neighborhoods that are walkable and have good transit access, people drive less and save money. Acknowledging this through policies such as location-efficient mortgages is a good idea.

San Mateo County recently set aside a portion of its STIP funding and offered it to local governments to build infill housing near transit. A huge project in Redwood City is getting built due to that policy. We would like transportation funds to be used elsewhere in the state in this way.

Betty Deakin: How have members of the panel dealt with planning process conflicts?

Julia Greene : There was a lot of conflict as we were developing the Habitat Plan in San Joaquin County. In order to get anything done, you need a leader with fire in the belly and somebody who will hang in there for a long time.

Michael Sweeney: Often conflicts are suppressed until late in the game. Our partnership seeks to engage people early in the process and deal with conflicts then.

James Corless: The Bay Area Metropolitan Transportation Commission gives small planning grants to neighborhood groups. This resolves conflict by bringing people into the process early on, asking them what they want, and getting them invested as stakeholders through the entire process.

Joan Sollenberger: Things break down if goals and objectives are not well-identified early in the process. Also, lack of clarity can make it difficult to understand the actual trade-offs involved and makes people question the process. The clarity of purpose is tied to the regional outlook, because understanding the cumulative impacts of these decisions requires a larger perspective.

Questions for Session III-B

Dennis O'Connor, Assistant Director, California Research Bureau*: What about existing projects that continue to exert stressors on the environmental system? They range from easy things such as how do you deal with non-point water pollution from runoff from streets and highways, to more difficult issues such as transportation systems simply being in the wrong place or improperly sized*. -**Michael Sweeney**: There are some bad projects out there that need to be

killed even if they are already approved. We also need early collaboration on issues like storm water and non-point pollution. **-James Corless**: There needs to be a more comprehensive look at each project's footprint, its environmental impacts, storm water runoff, pedestrian access, and comparing how it functions now to the way it functioned thirty years ago. We need to carry out such comparative analyses each time we rehabilitate.

C. Developing and Maintaining High Performance Transportation Systems

♦ New Transportation Technologies

Daniel Brand, Vice President, Charles River Associates, Inc.

There are three main questions about new transportation technologies. How will new technologies affect travel demand? How can they influence transportation system performance? And how can they be addressed in the state transportation plan?

The first type of new transportation technology, exemplified by high-speed rail and magnetic levitation trains (maglev), affects travel demand primarily by shortening travel times. Otherwise, the demand models are familiar, and can be estimated with new stated preference data. Ignoring cost differences and focusing solely on time and convenience, maglev and high speed rail can probably compete with auto and air at a range between 150 and 400 miles. This assumes that fares can be kept low, and that the facilities can be built.

The state plan should realistically evaluate at what speeds, times, and distances high-speed rail would be effective at serving the new regional urban structure, and the possible role of new high-speed common-carrier modes such as maglev or even automated highways. The demand analysis must avoid common mistakes, such as omitting modal constants, or assuming the value of time for "feet-up driving" on automated highways is the same as for manually-controlled auto driving.

Advanced Traveler Information Systems (ATIS) is the second type of new technology. Its possible benefits include knowing reliably where one is going to be and the freedom to plan around expected outcomes. It is more important to design ATIS to give drivers a sense of control and information about the situation than to strive for the unachievable goal of delivering time savings. When ATIS is implemented, travel times and distances may stay roughly the same, or even increase. But the benefits should be very substantial for those who have made tradeoffs in their own interest to manage the levels of congestion at which they choose to travel. ATIS can also reduce other components of travel disutility such as stress and anxiety.

The effects of the information technology (IT) revolution as a whole on travel demand and system performance are not well understood. It helps to think about three stages of innovation. In the first stage, the innovation performs an existing function better than before. In the second stage, the innovation is improved and new uses are found for it. In the third and most significant stage, the structure of the surrounding system adapts so that the innovation performs at still lower costs. Meanwhile, the old way of performing the function becomes obsolete.

Cities in the developed world are in the third stage of innovation with respect to the private car. The structure of cities has changed to allow the automobile to function more effectively, while fixed-route and scheduled public transit services perform less effectively. Since the private car has begun to age, IT is our candidate for a new first-stage innovation.

What will be the impact of the IT revolution on travel? How will we reach the third stage of innovation with regard to IT in transportation? As travelers come to rely on more dependable ways of accomplishing their work and play, will they value IT more highly? New technology

such as the fax machine and the Internet can make time more valuable.
In the long run, IT may have several possible outcomes. In metropolitan areas, there will be some infill and higher density development, as ATIS systems increase our ability to use existing metropolitan transportation capacity. Conversely, ATIS will facilitate market-driven solutions to increasing mobility, increasing the net benefits from travel; the result may be more travel.

Infrastructure constraints on physical travel will increase the already considerable burden on inter-regional commuters. The state transportation plan needs to concern itself with serving these already large regions. IT will lead to more super-commutes occurring fewer than five days a week, and intercity and international travel will likely increase. Air travel will increase, and areas of the US like the northeast corridor, with very high air fares relative to other parts of the country, are going to suffer as a result. California has low air fares and should work to promote the kind of competition that has kept air fares low. The state transportation plan should pay close attention to airport capacity and preserve existing ground corridor rights-of-way between and within cities.

Joe Hecker, Acting Division Chief of Operations, California Department of Transportation

Caltrans originally built its reputation as a building agency. Its new focus is on moving people and goods freely and safely. Four major themes are addressed in this presentation: system management; excess and latent demand; intelligent transportation systems; and mobility agreements.

There are four kinds of congestion. The most common type is recurrent, peak-hour congestion; the second is non-recurrent congestion, primarily due to accidents; the third is related to special events, such as planned lane closures; and fourth is congestion due to disasters such as earthquakes. In order to deal with these problems, system management involves three elements. These are information gathering and identification of needed improvements; a performance measurement system; and working together with partners.

Caltrans refers to its system management plan as TOPS, for Traffic Operations Program Strategies. The concept extends beyond traffic operations to encompass performance-oriented system management. If fully implemented, the plan will relieve congestion by better balancing demand through the system. Shifting travel time or mode, or reducing the need to travel at all, is pivotal. Demand management is followed by operating strategies that reinforce it, such as making sure travelers are aware of their options by providing real-time information. Other operating strategies include system-wide ramp metering and the HOV (High Occupancy Vehicle) system. Finally, when operating strategies have taken the last ounce of mobility out of the existing system, then physical improvements must be made.

Caltrans is coming up with guidelines to provide transportation data along with its regional partners, and have the private sector package that information for the public. In the Orange County area, Travel Tip is a private-public partnership that provides all modes of traveler information. Another example of a traveler information system is Caltrans's new Lane Closure Application, which includes real-time traveler information, incident data from the California Highway Patrol database, and planned lane closures.
Operational improvements are a key part of this program. They include auxiliary lanes, grade separation, lane balance, ramp modification, truck climbing lanes, and HOV drop ramps, in which users exit and enter the HOV system without merging with other traffic.

Caltrans has begun work on a Transportation Management Systems Master Plan, which will

include specific goals and objectives and a complete financial plan with benefit-cost analysis and performance measures. The Master Plan will include input from partners at other agencies and from local jurisdictions. Elements of the Plan include incident management; HOV facilities; transportation management centers; arterial management; traveler information; and ramp metering. There will be a regional management council to coordinate effective system management. Some integrated operations are already in place, such as the smart corridors in Santa Monica and Santa Clara, and the Southern California ITS Priority Corridor, spanning four Caltrans districts in Southern California.

The availability of new tools such as intelligent transportation systems (ITS) encourages new kinds of operations management. Back in the 1970s Caltrans created the first traffic operations center for a pilot 42-mile loop in Los Angeles, and the agency continues to develop new systems through its New Technology and Research Division. In particular, Caltrans is focusing on improving the reliability of existing technology. ITS also has applications in maintenance. One goal is to reduce the amount of personnel exposure on the roadway. Examples include "smart" snow plows and debris removal vehicles, and automatic crack sealing.

Caltrans is developing a freeway performance application (to ultimately include transit as well) called PeMS which will enable decision makers, planners, and the public to see what is happening on the system. In the future PeMs will enable congestion monitoring, and will be integrated with the Planned Lane Closure Application. PeMS will provide information on excess demand: the difference between free flow conditions, congestion under metering, and actual congestion on a link. Caltrans is also working with local jurisdictions to determine how its system affects local traffic.

♦ *Measuring Performance and Progress in Transportation*

Lance A. Neumann, President, Cambridge Systematics, Inc.

Performance-based planning is much more than performance measures. It is easy to get conceptual agreement on performance measures, but difficult to use performance measures as a tool. Successful performance-based planning involves significantly changing the way planning is done, and integrating performance measures into a systematic and ongoing implementation and monitoring process.

Performance-based planning includes identifying goals; linking them to quantifiable objectives; translating those objectives to performance measures; obtaining data to support those measures; analyzing and evaluating; providing decision support; and monitoring and feedback.

Without being linked to objectives that are understood and agreed upon, performance measures are meaningless. This is because the measures should be used to direct resource allocation decisions that are connected to agreed-upon objectives. The measures can then help decision makers understand how well the system is performing today; what the implications of policies, plans and programs are; where there are opportunities for improvement; and how the system is performing over time.

The debate over objectives, prior to developing performance measures, may be the most valuable step of this process. Differing objectives must be reconciled for performance-based planning to work. For example, the transportation system defined with respect to freight, and logical freight-sheds, will have a very different geography and focus from the system defined with respect to commuters, and commuter-sheds. Sustainability and equity provide another important example. . How constituents articulate their views on these subjects may be different than the concepts used

by professionals.

Performance measures should tie policy analysis, planning, resource allocation, and programming together. Performance measures that do not tie plans to resource allocation decisions are an empty exercise. The value of the statewide transportation plan will be how much it influences where money is spent, and how partnerships channel resources.

Performance-based planning and programming can demonstrate accountability in an era of flexible, variable funding. It can be an invaluable tool to communicate what are we trying to accomplish, and how well are we doing it. And finally, it helps articulate the consequences of making (and not making) certain decisions.

Performance-based planning is becoming more common for several reasons. Growing nationwide pressure for governmental accountability is reflected in increasingly stringent legislative requirements. With greater competition through privatization and outsourcing, public agencies are under more scrutiny, especially internationally. As transportation functions shift to the private sector, this will increase the need for performance measures, because the public sector will still have responsibility for policy setting and overall system management irrespective of whether the private sector is delivering services. An increased focus on customer service will also push agencies towards performance measures, especially since there is such variety among customers.

In Florida, performance measures are used very broadly at the state and regional level, cutting across multiple objectives and influencing where dollars are spent. In contrast, the state of Washington has focused heavily on freight mobility in a few corridors, defining a much narrower set of performance measures. Performance measures should reflect the particular issues that are being confronted, and the institutional arrangements within which they must operate.

The experience with performance measures is more advanced in California than in the nation as a whole. Many agencies in this state have started down the path, including Caltrans, SCAG, the MTC in the Bay Area, and the counties of Santa Clara, Contra Costa, and Orange. Status reports from eleven states and nine transit and regional agencies will soon be available on the Transportation Research Board website.

Data collection and analysis is the Achilles' heel for many agencies. In the short run, definable and usable measures will be constrained by available data. In the long term, performance measures can help determine how existing data collection systems need to change, in terms of data type, detail, and collection frequency. Finally, analysis methods and measures need to be sensitive to incremental policy actions.

What are some of the risks of performance-based planning? Benchmarking and "peer comparisons" can distract decision makers from working toward objectives, given the resources and issues at hand. Establishing unrealistic performance targets may create false expectations, or result in "gaming," in which objectives are fudged. External factors will affect consequences of decisions and influence measured results, rendering them less than perfect as indicators of good performance. Finally, decision makers may choose to ignore or even mis-use performance information. This requires sophistication about how measures are defined and how decision makers are engaged.

Finally, the attempt to connect transportation system measures to broader economic, environmental and social goals suggests a focus for the next generation of performance measures.

Questions for Session III-C

Xueming Chen, Project Manager, Los Angeles County Metropolitan Transportation Authority*: What is the difference between performance-based planning and the regular planning process? Secondly, how do you address intangible benefits? Third, doesn't each transportation sub-market, as well as each governmental level, need different performance measures?* **-Lance Neumann**: Effective regular planning and performance-based planning are probably equivalent. As for intangibles, we should be able to characterize all performance-related factors somehow, even if only in a qualitative way. Third, there will be changes we make to the transportation system that can support more than one customer sub-market. Finally, integrating statewide performance measures with those for local jurisdictions will be a key challenge.

Unidentified participant*: Will your web pages and information development integrate transit, rather than just using the automobile?* **-Joe Hecker**: A route guidance alternative is in the development stage. It is absolutely necessary to give motorists some opportunities to make alternative choices. **-Daniel Brand**: ATIS should be multimodal.

D. Financing a Transportation System for California's Future

Martin Wachs, Director, Institute of Transportation Studies, and Professor of City & Regional Planning and Civil & Environmental Engineering, University of California at Berkeley

Transportation finance in California has changed dramatically over the past century, and will continue to change over the coming decade or more. Finance is one of the single most important planning tools available to California as it develops its statewide transportation plan.

A hundred years ago transportation investments were financed locally. Roads provided access for such things as goods and mail delivery, garbage pickup, fire engines, and plumbers. Because of the access-related benefits, it seemed appropriate to finance roads by taxing the property, and it still is appropriate for most local streets and county roads.

In the 1920s, growth in truck and car traffic occurred at its highest rate in recorded history, with large increases in intercity travel. The state began financing intercity roads using general revenues, but the rate of growth was too high. So the state turned to bond financing. In 1922, 44 percent of California's budget was devoted to roads, through direct expenditures or bond payments.

As congestion continued to worsen, California decided to charge people directly for their use of the roads. The best method was to use tolls, but the cost of administering a toll was about 25 percent of revenue. The fuel tax was not quite as good as a toll, because it was not charged exactly at the time and place of use, but it cost only 3 percent of revenue to administer. So the fuel tax became the basis of California's transportation financing for most of the twentieth century. Over time, the fuel tax surpassed the property tax as the main source of highway revenue.

The fuel tax is ideal in some ways. It does charge users. The more that we benefit from using the system, and the more cost we impose on the system, the more we pay. But because it is buried in the price of fuel, users do not notice it much. Also, it is regressive, because low-income people pay a higher proportion of their income in the fuel tax than high-income people do.

The fuel tax also has other problems. It does not rise automatically with inflation like income and

sales taxes. Instead it must be adjusted by the legislature or popular vote. Also, fuel tax revenue has suffered greatly, though society has benefited, from the increased fuel efficiency of personal vehicles. Any transition to alternative fuels or electric vehicles will further reduce gas tax revenue.

As vehicle miles of travel increase, one might expect that fuel tax revenue would increase. But adjusted for inflation using the Consumer Price Index (CPI), and divided by the vehicle miles of travel, fuel tax revenue has been declining rather steadily. Meanwhile, the construction cost index has risen much more quickly than the CPI, so that even as the number of inflation-adjusted dollars per mile of use has been shrinking, each of those dollars buys less in terms of maintenance and construction of roads. As a consequence, operations and maintenance outlays per usage mile have declined, and the capital program has declined even further.

Today the fuel tax accounts for only 42 percent of transportation spending statewide. Meanwhile, the California Transportation Commission estimates over $100 billion in unmet transportation needs in the coming decade. Even if that estimate is inflated, it represents a substantial shortfall.

Where will this money come from? We have been increasing our reliance on sales taxes as the principal growth mechanism in transportation finance. A one percent general sales tax raises as much as a 15- to 18-cent fuel tax. County sales taxes also increase local control, allowing local governments to elicit voter support with lists of planned projects, and enabling them to build a project delivery capability. But the sales tax is not a user fee, and breaks the traditional nexus between the payer and the beneficiary. Also, sales tax revenue declines in recessions, when we often want to use transportation projects as a pump-priming measure for the economy.

There are other financing mechanisms to consider, such as tolls on new highways and bridges. VMT fees are technically possible, if politically volatile. And we could use development fees, so that land developers and homeowners could contribute directly to infrastructure that the land development process requires.

Financing mechanisms could be used to more effectively manage existing capacity. If we raise the prices on highly congested facilities at the peak hour, we know by actual measurement of people's behavior they will use carpools, pay the higher toll to get a faster ride, and shift to other modes. In California, we have 28 examples of cases in which the cost of parking was shifted from employer to employee by allowing employees to receive cash value in lieu of parking at work. In every single case, the rate of single occupancy vehicle driving went down, transit use increased, and carpooling increased even more.

In the end our politicians will decide how we finance the system. User fees were first recommended for the California transportation plan in the early 1970s. The state legislature rejected the concept by a unanimous vote. We now have the possibility of instituting user fees electronically, making it less difficult and costly. We have electronic toll collection on bridges and on the I-15 hot lanes. Perhaps times have changed. The California transportation plan is an opportunity to influence the views of local decision-makers. We should make a powerful statement about the importance of transportation finance as a central element of the state plan, rather than as an afterthought.

Commentary

Jeff Brown, Principal Consultant, Office of John Burton

Sales tax is the most flexible, responsive revenue stream in California. The county sales taxes will

have generated $20 billion when they sunset. If extended in those counties they could raise another $40 to $50 billion. Legislation currently being considered may allow local jurisdictions to impose a sales tax by a majority vote, rather than the current supermajority requirement, if the tax is imposed exclusively to fund transportation. We also need to find ways to protect the state gasoline sales tax from being used for other purposes. If passed by the voters statewide, Assembly Constitutional Amendment No. 9 (Dutra) would constitutionally dedicate the gasoline tax for transportation only.

Financial planning strategies need regional collaboration. If we can deliver projects at the state level while partnering with regions and local areas, we can reduce costs, and demonstrate to local constituencies that we are investing their dollars cost-effectively. This may allow us to explore new ways of financing that have yet to be discovered.

Commentary

Therese McMillan, Deputy Director of Policy, Metropolitan Transportation Commission

Will the way we finance transportation have impacts on travel demand? It is not likely, absent major shifts in public opinion and political will. Based on "support" or "somewhat support," a recent poll shows that 70 percent of taxpayers in the Bay Area support local transportation sales taxes; 64 percent support increased vehicle registration fees; 58 percent support statewide bond measures. In the lower fifty, 44 percent support increased bridge tolls, 26 percent higher bus fares, and only 23 percent a regional gas tax.

What about leadership at the state and federal levels? MTC was a potential recipient of a major federal grant for congestion pricing on the Bay Bridge back in the early 1990s. But no legislator in Sacramento was willing to carry the necessary state bill. The last toll increase in the Bay Area was after a major earthquake. Some new facilities have been tolled in Southern California, but this idea has not been well received in the north yet. Meanwhile, recently members of the legislatures in Washington and Sacramento have proposed to dispense outright with the fuel tax.

Can our financing system be structured to be more efficient, effective and equitable? Of course local dollars should pay for local services. But there are two obstacles in California to doing so. First, local property tax revenue is depressed due to Proposition 13, and has been diminished even further due to diversions by the state to the Education Revenue Augmentation Fund. Second, the local half-cent sales tax is an alternative, but the supermajority requirement is daunting. In the Bay Area, the counties of Alameda and Santa Clara cleared the two-thirds re-approval hurdle for their expiring transportation sales taxes, but every poll suggests that no other Bay Area county will be able to achieve this.

E. State Transportation Planning: Lessons Learned at this Conference and Elsewhere

Mortimer Downey, formerly Deputy Secretary, US Department of Transportation; currently Principal Consultant, pbConsult

A strategic transportation plan must serve California's people, enhance its prosperity, and protect its resources. That challenge is much broader than merely increasing mobility.

The US Department of Transportation has had experience over the past eight years with some of these issues. The DOT's attempt in 1993 to broaden the national highway system plan to include other transportation system elements, and its proposed performance partnerships with the states, both failed. So we decided to evaluate our own programs and policies, and determine strategically how those fit with a variety of national goals. What is the common mission of the Coast Guard, the Federal Aviation Administration, the Federal Railroad Administration and the Office of Space Transportation? We came up with five goals: safety, mobility, economic development, environmental protection and national defense.

California's strategic plan should include an assessment of the environment in which policy will operate. Thus this conference has addressed California's demographics, economy, the global context, technology and other contextual issues. Another element is gaining consensus about outcomes by identifying interests rather than positions. Finally, the toughest and most important step is choosing strategies based on relative effectiveness in achieving desired outcomes.

Increased flexibility of production, time-based competition, global production chains, and changes in the type and location of work are happening very rapidly. This does not match well with the slow-moving set of actions that we typically rely on in transportation planning.

A number of desired outcomes of transportation planning have to be wrapped together. Mobility is one of the important things we provide, but access is also important. Impacts on the environment have been important to consider, though at times they have driven the process. Finally, we have to consider equity: how plans affect different people within society.

Putting a mix of tools and strategies together is important. One tool is cooperative planning. Another is analysis, such as measuring characteristics of new modes and predicting what they can achieve, or understanding the close relationship between transportation and the environment. Such analysis is critical in informing the collaborative, interagency approach to decision making.

Capital investment can still shape a region. Historic transportation infrastructure investments—seaports, canals, railroads, highways, and now airports—are still around, and investments are being made in each of them. But managing the transportation system is more important than ever before, since more of the system exists now than will ever be added.

The application of economic incentives can cause desired outcomes to happen. How to pay, and who pays, and the effects that that has on the system, are key. However, pricing policies are currently unpopular. No one was beating on DOT's door to use the available funding for congestion pricing projects. But ultimately it will come.
The federal government has a tremendous impact on California's transportation system. New highway and transit legislation will come up for action by Congress in about 2003, as will Air 21, last year's aviation bill. There may be a Sea 21, which would address ports and intermodal connections. The tenth effort to reform Amtrak is also coming soon. Meanwhile, California will increase the size and power of its federal delegation due to the Census.

Transportation can make fundamental contributions to economic development, a sound environment, and equity. Federal rules should not interfere with those goals. A state transportation plan that makes the compromises necessary to gain the support of all stakeholders at the table would be a strong basis for a political advocacy effort at the federal level: to look at not only changing the rules, but raising the money needed to put a 21st century system in place.

E. Where Does the State's Transportation Planning Process Go From Here?

Jeff Morales, Director, California Department of Transportation

The DOT challenge is to improve transportation as we grow to 45 million people. We want a system that is safe, efficient, reliable, interconnected, and equitable. Our plan needs to influence what happens over the next 20 years, not just react to events.

Across the state, travel is increasingly interregional and long-haul in nature. But decision making has become fragmented and localized. Three-quarters of the STIP is decided by 45 regional agencies; the other 25 percent is controlled by the state. The Governor's congestion relief program begins to reverse this trend. If trucking at the ports of Los Angeles and Long Beach bogs down and becomes uncompetitive because of congestion, that is a statewide problem. The same is true if Silicon Valley chokes on congestion, causing businesses to relocate out of state.

Since the governor was elected, the DOT budget has grown from $6.3 to $10 billion. Expectations of what we should do with that money have grown even faster. So we are reinventing ourselves as managers of a transportation system that includes all modes of transportation. Our new mission statement is: We improve mobility across California. Our view of mobility is mobility for a purpose: to enhance quality of life, to maintain access for communities, to connect people with jobs, and to encourage economic growth.

We must set performance measures that we understand, and goals that we can consciously work towards. People do not care how many miles of highway we lay down. They care about congestion, quality of life and mobility. We face a challenge in defining these desired outcomes.

Local governments continue to show their willingness to pay for transportation, as in the counties of Alameda and Santa Clara. There are other encouraging signs. California transit ridership is growing faster than the national average. People will ride transit if we give them good options.

DOT has to work across traditional boundaries and take a seat at the table when it comes to issues such as land use planning. Taking tough issues such as jobs-housing balance and fiscal incentives and calling them transportation problems is making the root problems worse. The DOT can influence this process in the way we make our investments and how we target our funding, moving away from the traditional role of a banker handing out money to the role of an investor in a project who wants a fair return. For the expansion of the light rail system around Sacramento, we plan to provide funding while encouraging mixed use and higher density development around stations, and to package our funding with other state sources that can help in this process.

We want to streamline the environmental process, not by weakening protections, but by making the system work better. The process is currently very antagonistic. It has not focused on making needed improvements and providing the maximum amount of environmental protection. At DOT we will increasingly be environmentally sensitive.

In an era when the ability to add new capacity is lessened, we need to better utilize existing capacity. In California we are fortunate to have many corridors with parallel freeways, or freeways paralleled by rail lines, busways, or major arterials. Managing the system more effectively involves maximizing the use of those choices. It has been suggested that the Port of Long Beach could increase its productivity 200 percent by going to a 24/7 schedule and taking full advantage of existing corridor infrastructure capacity. Around the state, during non-peak hours capacity is available, and alternate modes are half empty during peak hours. Thus we could help manage the freeway system by helping transit operators manage their systems.

We are facing in California a reinvention challenge, rethinking every aspect of how we do what we do. This plan will provide a blueprint, and this conference is providing useful input to help us figure out how to get on the right path.

Questions for Session III-E&F

LeRoy Graymer*: It is my understanding that what you hope to be able to do is to get the planning process moved along so that in the year 2002 there is a product. Will this be an ongoing process?*
-Jeff Morales: Yes. As much as I'm a fan of strategic planning, I'm much more into strategic doing. We see the plan as a way of helping codify what we are already doing. It has to be a living, breathing process.

Appendix

- Symposium Program